AC/DC Converter

DA10-220SXXP2D4 (-T)(-TS) Series

Typical Features

- Input voltage range 90-310VAC/127-438VDC
- No load power consumption ≤0.25W@230VAC
- Efficiency 83% (Typ.)
- Operating temperature from -40℃ to +65℃
- Switching frequency 65KHz
- Short-circuit & over-current protections
- Isolation voltage 3100VAC
- Altitude during operation 3000m Max
- Compliant with IEC/EN62368/UL62368
- With TUV/CE certificate
- Enclosed plastic case, flame class UL94-V0
- PCB DIP Mounting

Application Field

DA10-220SXXP2D4 Series *----- Compact size & high efficiency power supplies with global adapted input voltage (both AC & DC available), low ripple, low temperature rise, low no load power consumption, high reliability, safety isolated and good EMC performance. This series of products can be widely used in the fields of Electric power, Industrial, Instrument and Smart home devices, etc. The additional circuit diagram for EMC is recommended for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No	Output Specification			Max Capacitive Load@220VAC	Ripple & Noise 20MHz (Max)	Efficiency @Full Load 220VAC
		Power	Voltage	Current			
		(W)	Vo(V)	Io(mA)	u F	mVp-p	% (Typ.)
TUV/CE	DA10-220S3V3P2D4	6.6	3.3	2000	6000	100	74
	DA10-220S05P2D4	7.5	5	1500	6000	150	74
	DA10-220S09P2D4	10	9	1111	5000	150	81
	DA10-220S12P2D4	10	12	833	5000	150	82
	DA10-220S15P2D4	10	15	667	4000	150	82
	DA10-220S24P2D4	10	24	417	500	100	83

Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load, the minimum efficiency can be -2% of the typical value.

Note 2: Please contact Aipu sales for other output voltages requirements in this series but not in this table.

Note 3: The suffix -T is for a kind of chassis package with terminals, -TS is for a kind of package of DIN Rail which width is 35mm.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	90	220	310	VAC
	DC Input	127	310	438	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	100VAC	-	-	0.25	A
	220VAC	-	-	0.15	
Surge Current	100VAC	-	-	10	
	220VAC	-	-	20	
No Load Power Consumption	Input 115VAC	-	-	0.25	W
	Input 230VAC	-	-		
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommended	-	2A-5A/400VAC Time-delay fuse			
Hot Plug	-	Unavailable			
Remote Control	-	Unavailable			

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	-	±2.0	±3.0	%
Line Regulation		Rated Load	-	-	±0.5	%
Load Regulation		Nominal input voltage, 20%~100% load	-	-	±1.0	%
Minimum Load		Single Output	10	-	-	%
Turn-on Delay Time		Input 115Vac (full load)	-	1500	-	mS
		Input 220Vac (full load)	-		-	
Power-off Holde Up Time		Input 115VAC (full load)	-	80	-	mS
		Input 220VAC (full load)	-		-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%	-5.0	-	+5.0	%
	Recovery time		-	-	+5.0	mS
Output Over-shoot		Full input voltage range	≤10%Vo			%
Short circuit protection			Continuous, Self-recovery			Hiccup
Drift Coefficient		-	-	±0.03%	-	%/℃
Over Current Protection		Input 100-265VAC	≥110% Io, Self-recovery			Hiccup
Ripple & Noise		-	-	80	150	mV

Note: The ripple and noise are tested by the twisted pair method, please refer to the following Ripple & Noise test Instruction.

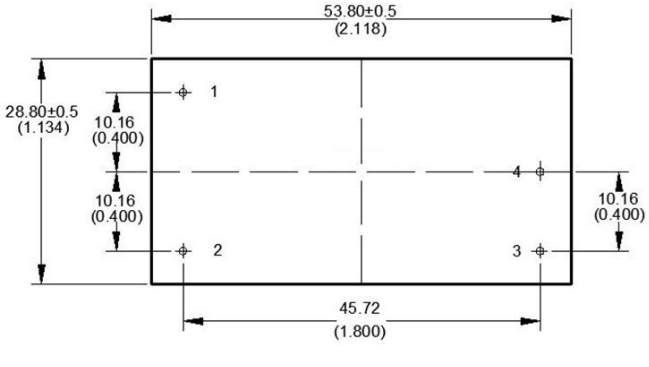
General Specifications

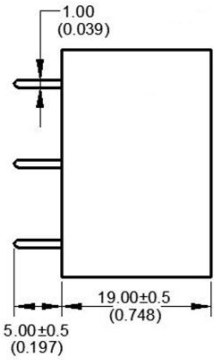
Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the Temperature Derating Graph	-40	-	+65	℃
Storage Temperature	-	-40	-	+105	
Soldering Temperature	Wave-soldering	260±4℃, timing 5-10S			
	Manual-soldering	360±8℃, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	I/P-O/P, Test 1 min, leakage current ≤5mA	3100	-	-	VAC
Insulation Resistance	I/P-O/P, @DC500V	100	-	-	MΩ
Safety Standard	-	IEC/EN62368			
Vibration	-	10-55Hz,10G, 30 Min, along X,Y,Z			
Safety Class	-	CLASS II			
Flame Class of Case	-	UL94-V0			
MTBF	-	MIL-HDBK-217F@25℃ > 300,000H			
Unit Weight	Part No.	Weight (Typ.)			
	DA10-220SXXP2D4	50g			
	DA10-220SXXP2D4-T	70g			
	DA10-220SXXP2D4-TS	90g			

EMC Performances

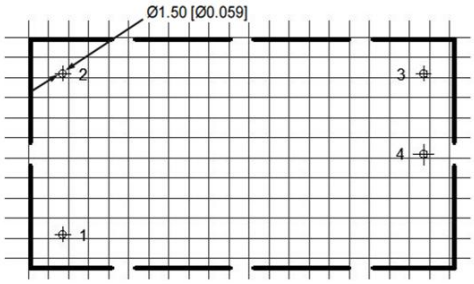
Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 1,2)
		RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 1,2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (with the Recommended Circuit 1,2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (with the Recommended Circuit 1,2)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±2KV / line to ground ±4KV Perf.Criteria B (with the Recommended Circuit 1,2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (with the Recommended Circuit 1,2)
		PFMF	IEC/EN61000-4-8	10A/m Perf.Criteria A
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

P2 Package Mechanical Dimensions





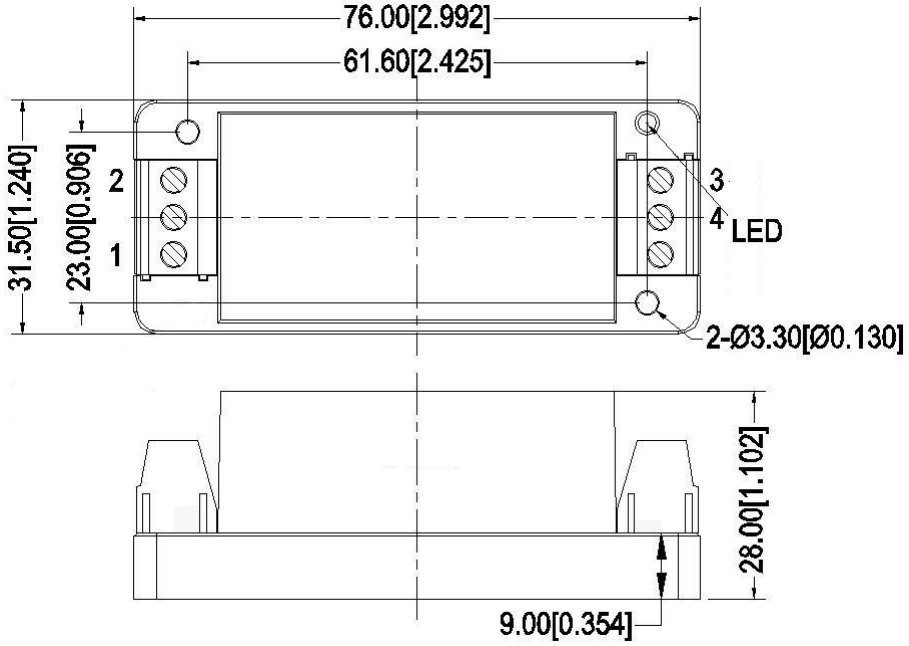
Pin No.	Function
1	AC(N)
2	AC(L)
3	+Vout
4	-Vout



PCB layout vertical view
Grid 2.54x2.54(0.10x0.10)

Unit: mm(inch)
General tolerance: ±0.50(±0.020)
Pin diameter tolerance: ±0.10(±0.004)

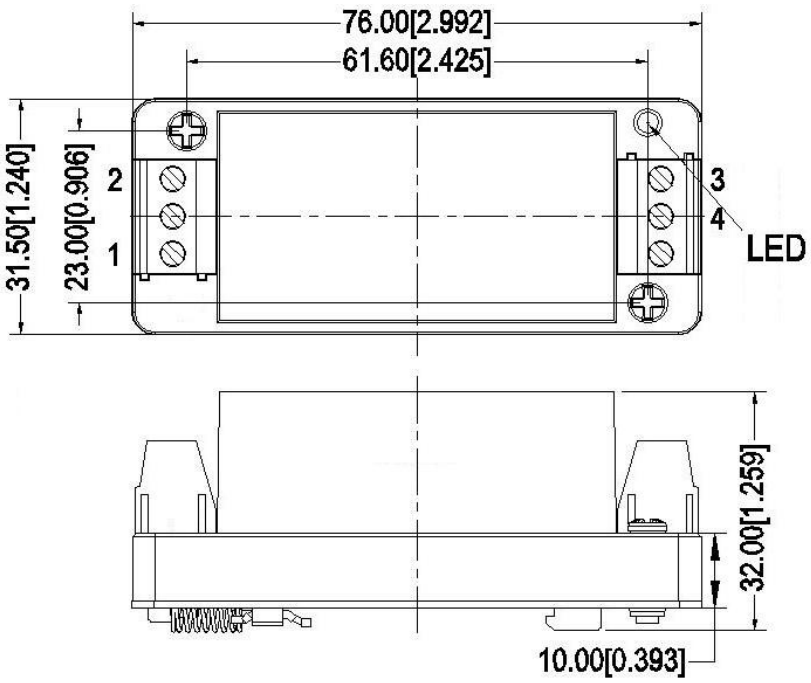
P2-T Package Mechanical Dimensions



Terminal No.	Function
1	AC(N)
2	AC(L)
3	+Vout
4	-Vout

Note:
Unit: mm[inch]
Lead wires gauge: 24-12 AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00[±0.039]

P2-TS Package Mechanical Dimensions



Terminal No.	Function
1	AC(N)
2	AC(L)
3	+Vout
4	-Vout

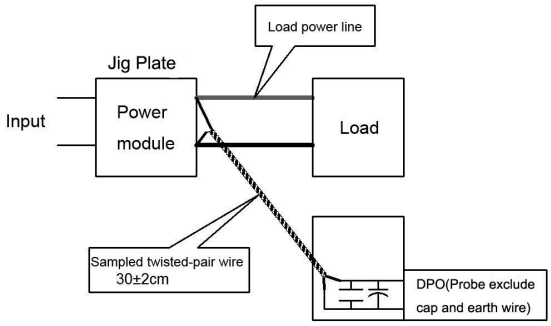
Note:
Unit: mm[inch]
Lead wires gauge: 24-12 AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00[±0.039]

Package Code	Dimensions L x W x H	
P2	53.80X 28.80X19.00 mm	2.118X1.134X0.748 inch
P2 -T	76.00X31.50X28.00 mm	2.992X1.240X1.102 inch
P2 -TS	76.00X31.50X32.00 mm	2.992X1.240X1.259 inch

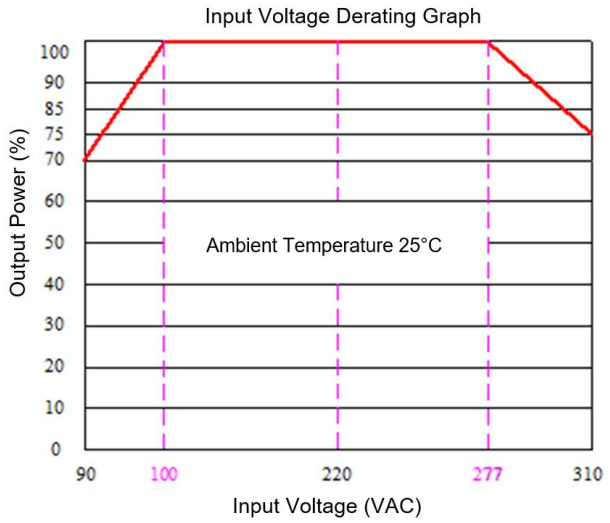
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

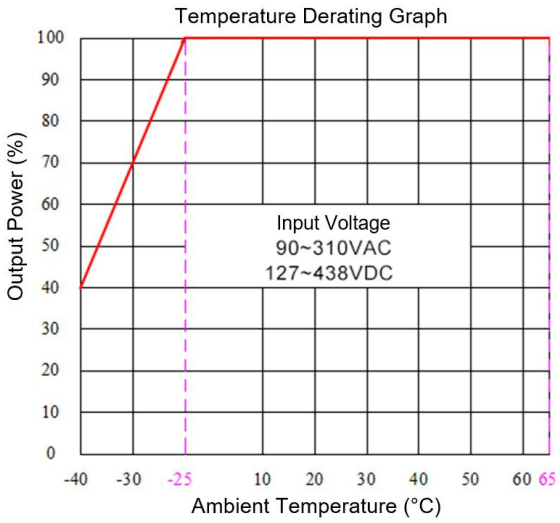
1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

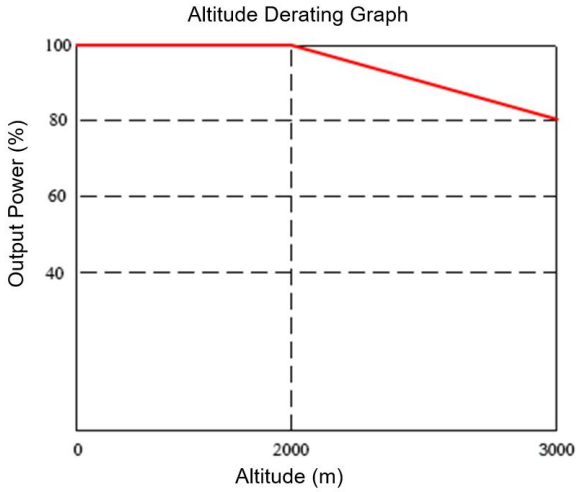
2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be start after input power on.



Product Characteristics Graphs







Note 1: The output power should be derated based on the input voltage derating graph at 90~100VAC/277~310VAC & 127~140VDC/390~438VDC.

Note 2: This product should operate at the natural air condition, please contact us if it need be used at a closed space.

Recommended Circuits for Application

Recommended circuits diagrams for EMC

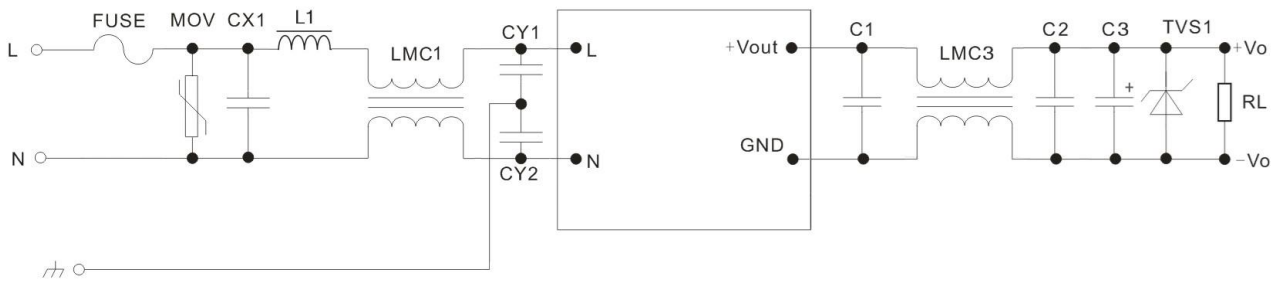


Figure - Circuit 1

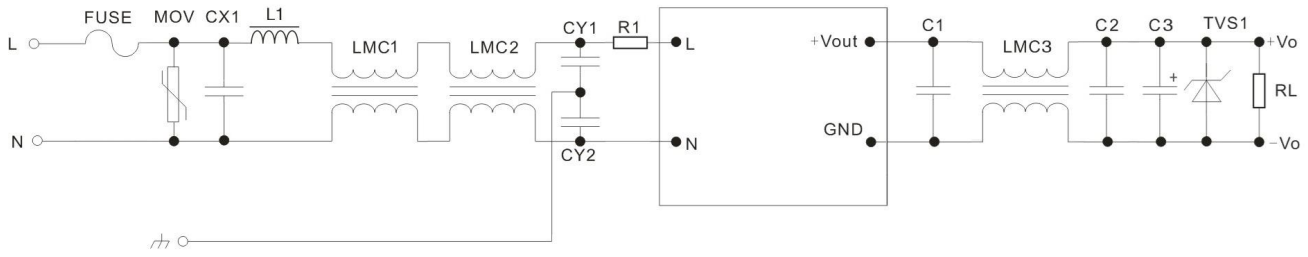


Figure - Circuit 2

Components	FUSE	Varistor	X Cap	DMC	CMC	CMC	Y Cap	Wire-wound resistor	SMD Cap	CMC	E-Cap	TVS
Part No.	FUSE	MOV	CX1	L1	LMC1	LMC2	CY1 CY2	R1	C1 C2	LMC3	C3	TVS1
DA10-220S3V3P2D4	2A/ 400V Time delay fuse	14D561 K/4500A	X2/2 24K/ 310 VAC	2.5uH/ 2.5A	UU9.8 / 25mH/ 0.3A	UU9.8 / 30mH/ 0.3A	Y1/ 102 M/ 400 VAC	2W/ 10Ω	0.1uF/ 50V	145uH /3A	220 uF	SMBJ7.0A
DA10-220S05P2D4												SMBJ7.0A
DA10-220S09P2D4												SMBJ20A
DA10-220S12P2D4												SMBJ20A
DA10-220S15P2D4											47 uF	SMBJ20A
DA10-220S24P2D4												SMBJ20A

Note:

1, A high-frequency, low-resistance electrolytic capacitor is recommended for C3 which capacitance and current should refer to the technical specifications of its manufacturer. The withstand voltage of C3 should be derated to be at least 80%.

2, 104K/50V/1206 ceramic SMD capacitors are recommended for C1 & C2 to suppress the high frequency noise.

3, TVS is recommended to protect the output circuit when the power supply operates at abnormal condition.

4, FUSE is necessary for the application, not optional.

Application Notice

1.The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.

2. A fuse should be connected at input.

3. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.

4. The product performance in this datasheet cannot be guaranteed if it works at over-load condition.

5. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).

6. All values or indicators in this datasheet had been tested based on Aipupower test specifications.

7.The specifications are specially for the parts listed in this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.

8. Aipupower can provide customization service.

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